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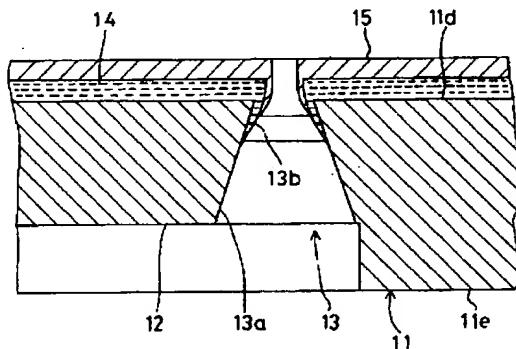
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(54)【発明の名称】 インクジェットヘッドの製造方法

(57)【要約】

【目的】 流路基板のインク流路部は親水性を高くし、ノズル部は撥水性を高くすることにより、高性能化したインクジェットヘッドを安価に製造する。

【構成】 A B S樹脂を用いて、インク流路部12及びノズル部13を有する流路基板11を成形する。親水性処理工程は、流路基板全体をクロム酸・硫酸液に浸漬して行う。これにより、流路基板全体に親水性が付与される。次に流路基板のノズル面側11dをN i - P複合メッキ液中に浸して、ノズル面側及びノズル部の出口部13bの内周面に高撥水性のN i - Pが共析した被膜が形成される。さらに高撥水性を必要とする場合には、N i - Pの被膜14の表面に電着法により、撥水性の高い物質15の層を形成する。この結果、流路基板11のインク流路部12は親水性が高くなり、ノズル部13の出口部13bは撥水性が高くなり、これを採用することによりインクの吐出性能の秀れたものとなる。



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インクジェットヘッドを安価に製造可能にすることにある。

【0006】

【課題を解決するための手段】上記の目的を達成するため、本発明のインクジェットヘッドの製造方法は、流路基板にインク流路部及びノズル部を形成する工程と、インク流路部に表面処理により親水性を施す親水性処理工程と、ノズル部に表面処理により撥水性を施す撥水性処理工程とを含むことを特徴とするインクジェットヘッドの製造方法。

【請求項1】 流路基板にインク流路部及びノズル部を形成する工程と、上記インク流路部に表面処理により親水性を施す親水性処理工程と、上記ノズル部に表面処理により撥水性を施す撥水性処理工程とを含むことを特徴とするインクジェットヘッドの製造方法。

【請求項2】 請求項1において、上記撥水性処理工程は、無電解複合メッキ法により上記ノズル部に撥水性を有する物質を共析させることを特徴とするインクジェットヘッドの製造方法。

【請求項3】 請求項1において、上記撥水性処理工程は、無電解メッキ法により上記ノズル部をメッキ処理した後に電着法により上記ノズル部に撥水性を有する物質を析出させることを特徴とするインクジェットヘッドの製造方法。

【発明の詳細な説明】

【0001】

【産業上の利用分野】 本発明は、インクジェットヘッドの製造方法に関するものである。

【0002】

【従来の技術】 インクジェットヘッドの一般的な流路基板の構成は、流路溝を形成してある面に蓋板を被せてインク流路を作り、インク流路の先端にノズル部を設けてある。インク流路の途中には加圧室が設けてあり、これらの加圧室と対向する流路基板または蓋板の外面に圧電素子を設け、加圧室内のインクにエネルギーを付与可能にしてある。

【0003】 加圧室でエネルギーを付与されたインクは、細いインク流路を通ってノズル部から吐出される。インク流路内のインクは、毛細管現象によって進行するため、インク流路は親水性が高いことが望ましい。そのため、インク流路を構成する部材には親水性の高い材料を採用し、または親水性を高くするために親水性処理を施したりしている。これに対し、ノズル部は、インクをノズルの先端から分離して、勢いよく飛び出させるためには撥水性が高いことが望まれている。このため、ノズル部を構成する部材として撥水性の高い材料を用い、親水性が高い流路基板を構成する部材と、撥水性が高いノズル部を構成する部材とを積層することが行われている。

【0004】

【発明が解決しようとする課題】 しかし、上記したように、流路基板とノズル部とを別部材によって構成すると、インクジェットヘッドの部品点数が増え、かつ組み立て工数も増えるのでコスト高の原因となっている。

【0005】 本発明の目的は、ノズル部を流路基板と一緒にし、インク流路は親水性が高く、そしてノズル部は撥水性を高くする処理を施すことにより、性能の秀れた

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撥水性処理工程としては、無電解複合メッキ法によりノズル部に撥水性を有する物質を共析させ、あるいは無電解メッキ法によりノズル部をメッキ処理した後に電着法によりノズル部に撥水性を有する物質を析出させることができ望ましい。

【0008】

【作用】 流路基板に形成されたインク流路部に親水性処理を施して、インクの流通を促進し、同じ流路基板に形成されたノズル部に撥水性処理を施すことにより、インクの噴出を容易にする。したがって、同一の流路基板に親水性を有するインク流路部と撥水性を有するノズル部とを設けることができ、性質の相反するものでも別部材とする必要がなく、インクジェットヘッド構成が簡単になる。

【0009】 撥水性処理工程として、無電解複合メッキ法によりノズル部に撥水性を有する物質を共析させれば、ノズル部の撥水性が一層向上する。

【0010】 また、撥水性処理工程として、無電解メッキ法によりノズル部をメッキ処理した後に電着法により、ノズル部に撥水性を有する物質を析出させれば、ノズル部の撥水性がより一層向上する。

【0011】

【実施例】 以下本発明の実施例について図面を参照して説明する。本発明に係るインクジェットヘッドは、流路基板に形成されたインク流路に親水性処理を施し、ノズル部に撥水性処理を施すところに特徴があり、他の一般的な構成については従来技術と同様の構成及び製造法を採用しているので、ここでは、流路基板についてのみ説明することとする。

【0012】 図4に示すように、流路基板1は円板部1 aの両側に組み立て用の突部1 b、1 bを有し、板面には24本のインク流路部2が放射状に設けてある。流路基板1としては、メッキ処理が容易なABS樹脂の射出成形品を採用している。各インク流路部2には、流路基板1の縁部1 cの内側に沿って、図示しない蓋板に設けられたインク供給孔と連通するインク受け部2 aが形成されている。また、受け部2 aに統いて設けられた加圧室2 b及び加圧室からインクを流路基板1の中心部に向けて導く流出部2 cが形成している。各流出部2 cの先端部には、紙面に垂直方向に貫通するノズル部3…が形成してある。各ノズル部3は、流路基板1の板厚方向に

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垂直に設けられており、入り口部3aを大きくし、出口部3bを小さくするテーパ状に形成してある(図2参照)。

【0013】これらの各インク流路部2には、親水性処理が施してあり、ノズル部3の出口部3bには、撥水性処理が施してある。流路基板1のインク流路部側1eには、図示しない蓋板が被せてあり、その上にさらに図示しないインクプール基板が積層してある。

【0014】次に流路基板の製造方法について説明する。流路基板1は、ABS樹脂の射出成形により製造する。このとき、インク流路部2及びノズル部3も同時に形成される。

【0015】次にインク流路部2に親水性処理を施す。親水性処理工程は、クロム酸・硫酸液中に流路基板1全体を浸漬し、流路基板全体を洗浄することにより行われる。クロム酸・硫酸により表面が活性化し、このクロム酸・硫酸に浸漬された流路基板全体の表面に親水性が付与される。この結果、流路基板1のインク流路部2の親水性が向上するとともに、ノズル面側1dのメッキ処理も容易になる。

【0016】次に、流路基板1のノズル部3の撥水性処理工程は、流路基板のノズル面側1dに無電解複合メッキを施すことにより行われる。

【0017】無電解複合メッキは、Ni-P溶液中にノズル面だけを静かに浸漬することにより行われる。図1に示すように、このメッキ処理により流路基板1のノズル面1d及びノズルの出口部3bにのみ、Ni-Pのメッキ層からなる撥水性を有する物質の層4が形成される。このとき、ノズル部3の出口部3bの直径は数十μmと微小なものであるため、メッキ液を強制的に循環させない限り内部にはメッキがつかないので、ノズル面側1d及びノズル部の出口部3bにだけメッキが施される。

【0018】無電解複合メッキ法として、ふつ素樹脂の粒子を共析させるメッキ液を用いると、ノズル部3の出口部3bの内周面に撥水性の高いふつ素樹脂が共析して被覆するためノズル部の撥水性を向上させることができる。

【0019】他の実施例として、図3に示すように、流路基板1のノズル面に無電解メッキ層14を形成し、さらにその上に電着塗装により、撥水性の高い物質、例えばアクリル系あるいはアミノアルキド樹脂系などの物質15を被覆する。こうすると、ノズル部13の撥水性が向上し、さらにインクの吐出が良好になる。

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【0020】無電解メッキ層14は、電着塗装の下地処理としてのみ機能させる場合には、Cuなどの金属メッキ層であれば何でもよいが、ふつ素樹脂など撥水性の高い物質を共析させた無電解メッキ層とすればさらに撥水性の高いものが得られる。

【0021】なお、本実施例では、流路基板の素材として、メッキ性の良好なABS樹脂を採用しているが、これをガラスやセラミック等他の基板材料で構成した場合にも同様に適用可能である。

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【0022】

【発明の効果】本発明によれば、流路基板のインク流路部に親水性処理を施し、ノズル部に撥水性処理を施す行程を経てインクジェットヘッドを製造するものであるため、高い親水性を要求される部分と、これと相反する性質である高い撥水性を要求される部分を同一の素材によって構成することができる。このため、インクジェットヘッドの構成が簡単となり、インクジェットヘッドのコストの引き下げに寄与する。

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【0023】また、撥水性処理工程として、無電解複合メッキ法により、ノズル部に撥水性を有する物質を共析させようすれば、ノズル部の撥水性が向上し、さらに性能の秀れたインクジェットヘッドが得られる。さらにまた、無電解メッキ法によりノズル部をメッキした後に、電着法により撥水性の高い物質を析出させるようすれば、さらに一層秀れたインクジェットヘッドが製造可能になる。

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【図面の簡単な説明】

【図1】流路基板のノズル部に無電解メッキ法により撥水性処理を施した状態を示すモデル図である。

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【図2】撥水性処理前の流路基板の状態を示すモデル図である。

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【図3】流路基板のノズル部に無電解メッキ処理を施し、その上に電着法により撥水性処理を施した状態を示すモデル図である。

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【図4】流路基板の流路部側の構成例を示す平面図である。

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【符号の説明】

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1, 11 流路基板

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2, 12 インク流路部

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3, 13 ノズル部

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4, 14 無電解メッキ法により形成された撥水性を有する物質

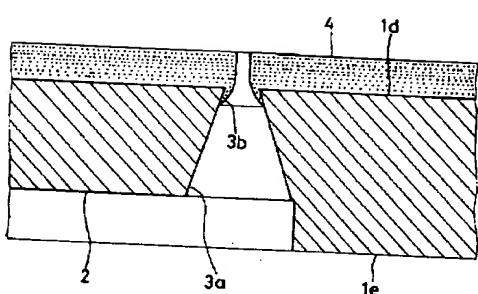
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15 電着法により形成された撥水性を有する物質

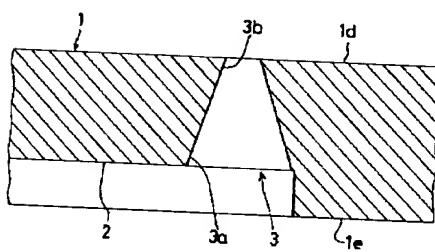
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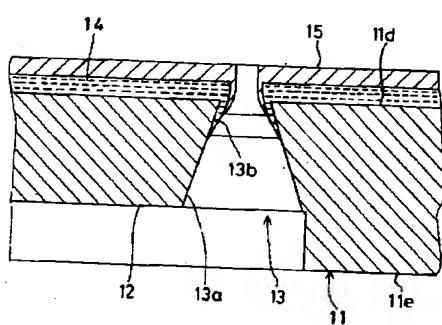
【図1】



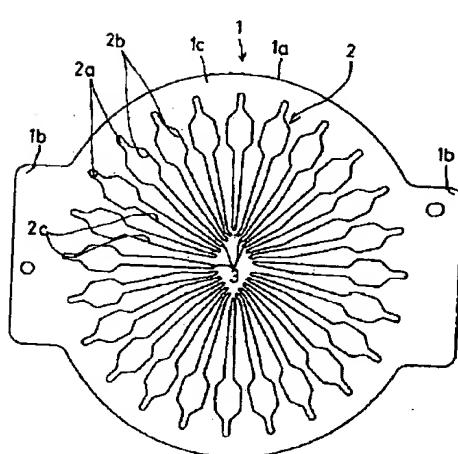
【図2】



【図3】



【図4】



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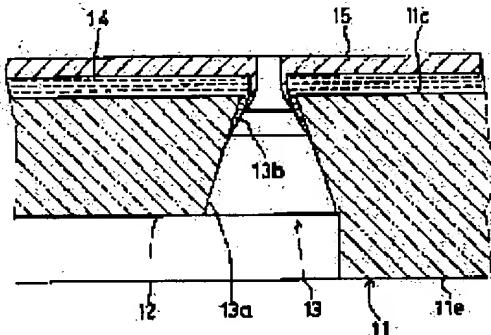
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YONEZAWA KEIICHI**

(54) MANUFACTURE OF INK JET HEAD

(57)Abstract:

PURPOSE: To manufacture inexpensively ink jet heads with high abilities by increasing a hydrophilic property in the ink channel of a passage base plate, and increasing water repellency in its nozzle part.

CONSTITUTION: Formed in use of ABS resin is a passage base plate 11 having an ink channel 12 and nozzle part 13. The process for a hydrophilic property is performed such that the entire of the passage base plate is immersed in a solution of chronic acid and sulphuric acid. In this manner, the whole of the passage base plate is given water repellency. Next, the nozzle surface side 11d of the passage base plate is soaked in a solution of Ni-P composite coatings so that a coating film having high water repellent eutectoid Ni-P is formed on the nozzle both sides and inner circumferential surface of outlet 13b of the nozzle part. In the case where further high water repellency is required, the layer of a substance 15 with high water repellency is formed on the Ni-P coated surface 14 by electro-deposition. As a result, the ink channel 12 of the passage base plate 11 has a hydrophilic property, and the outlet 13b of the nozzle part 13 has a high water repellency, and further by employing this method, ink discharge performance comes to be excellent.



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CLAIMS

[Claim(s)]

[Claim 1] The manufacture approach of the ink jet head characterized by including the process which forms the ink passage section and the nozzle section in a passage substrate, hydrophilic down stream processing which gives a hydrophilic property to the above-mentioned ink passage section by surface treatment, and water-repellent down stream processing which gives water repellence to the above-mentioned nozzle section by surface treatment.

[Claim 2] It is the manufacture approach of the ink jet head characterized by carrying out the eutectoid of the matter to which the above-mentioned water-repellent down stream processing has water repellence in the above-mentioned nozzle section with non-electrolyzed compound plating in claim 1.

[Claim 3] It is the manufacture approach of the ink jet head characterized by depositing the matter which has water repellence in the above-mentioned nozzle section with an electrodeposition process after the above-mentioned water-repellent down stream processing carries out plating processing of the above-mentioned nozzle section by the electroless deposition method in claim 1.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Industrial Application] This invention relates to the manufacture approach of an ink jet head.

[0002]

[Description of the Prior Art] The configuration of the common passage substrate of an ink jet head puts a cover plate on the field which has formed the passage slot, makes ink passage, and has prepared the nozzle section at the tip of ink passage. The pressurized room is prepared in the middle of ink passage, a piezoelectric device is prepared in the external surface of these pressurized rooms, the passage substrate which counters, or a cover plate, and grant of energy is enabled at the ink in a pressurized room.

[0003] The ink to which energy was given in the pressurized room is breathed out from the nozzle section through thin ink passage. Since the ink in ink passage runs by capillarity, as for ink passage, it is desirable for a hydrophilic property to be high. Therefore, hydrophilic processing has been performed, in order to adopt the high ingredient of a hydrophilic property as the member which constitutes ink passage or to make a hydrophilic property high. On the other hand, in order for the nozzle section to dissociate from the tip of a nozzle and to make ink jump out with sufficient vigor, it is desired for water repellence to be high. For this reason, carrying out the laminating of the member from which a hydrophilic property constitutes a high passage substrate using a water-repellent high ingredient as a member which constitutes the nozzle section, and the member from which water repellence constitutes the high nozzle section is performed.

[0004]

[Problem(s) to be Solved by the Invention] However, since the components mark of an ink jet head will increase and the number of assemblers will also increase if another member constitutes a passage substrate and the nozzle section as described above, it is the cause of cost quantity.

[0005] The purpose of this invention makes the nozzle section a passage substrate and one, ink passage has a high hydrophilic property, and it is in the nozzle section enabling cheaply manufacture of the ink jet head on which the engine performance exceeded by performing processing which makes water repellence high.

[0006]

[Means for Solving the Problem] In order to attain the above-mentioned purpose, the manufacture approach of the ink jet head of this invention has the description in the place containing the process which forms the ink passage section and the nozzle section in a passage substrate, hydrophilic down stream processing which gives a hydrophilic property to the ink passage section by surface treatment, and water-repellent down stream processing which gives water repellence to the nozzle section by surface treatment.

[0007] After carrying out the eutectoid of the matter which has water repellence in the nozzle section with non-electrolyzed compound plating as water-repellent down stream processing or carrying out plating processing of the nozzle section by the electroless deposition method, it is desirable to deposit the matter which has water repellence in the nozzle section with an electrodeposition process.

[0008]

[Function] Jet of ink is made easy by performing hydrophilic processing to the ink passage section formed in the passage substrate, promoting circulation of ink and performing water-repellent processing to the

nozzle section formed in the same passage substrate. Therefore, the ink passage section which has a hydrophilic property in the same passage substrate, and the nozzle section which has water repellence can be prepared, it is not necessary to also use as another member that with which a property disagrees, and an ink jet head configuration becomes easy.

[0009] If the eutectoid of the matter which has water repellence in the nozzle section with non-electrolyzed compound plating is carried out as water-repellent down stream processing, the water repellence of the nozzle section will improve further.

[0010] Moreover, as water-repellent down stream processing, after carrying out plating processing of the nozzle section by the electroless deposition method, if the matter which has water repellence in the nozzle section is deposited, the water repellence of the nozzle section will improve further with an electrodeposition process.

[0011]

[Example] The example of this invention is explained with reference to a drawing below. Since the ink jet head concerning this invention has the description in the place which performs hydrophilic processing to the ink passage formed in the passage substrate, and performs water-repellent processing to the nozzle section and the same configuration and same manufacturing method as the conventional technique are used for it about other general configurations, suppose it that only a passage substrate is explained here.

[0012] As shown in drawing 4, the passage substrate 1 is assembled on both sides of disk section 1a, it has the projected parts 1b and 1b of business, and the 24 ink passage sections 2 are provided in the plate surface at the radial. As a passage substrate 1, plating processing has adopted the injection-molded product of easy ABS plastics. Along with the inside of edge 1c of the passage substrate 1, the ink feed holes prepared in the cover plate which is not illustrated and ink receptacle section 2a open for free passage are formed in each ink passage section 2. Moreover, outflow section 2c which turns and leads ink to the core of the passage substrate 1 from pressurized-room 2b and the pressurized room which were prepared following receptacle section 2a is formed. Nozzle section 3 -- perpendicularly penetrated in space is formed in the point of each outflow section 2c. Each nozzle section 3 is formed in the shape of [which is established at right angles to the direction of board thickness of the passage substrate 1, enlarges entry section 3a, and makes outlet section 3b small] a taper (refer to drawing 2).

[0013] Hydrophilic processing has been performed to each of these ink passage sections 2, and water-repellent processing has been performed to outlet section 3b of the nozzle section 3. The cover plate which is not illustrated is put on ink passage section side of passage substrate 1 1e, and the laminating of the ink pool substrate which is not further illustrated on it has been carried out.

[0014] Next, the manufacture approach of a passage substrate is explained. The passage substrate 1 is manufactured with injection molding of ABS plastics. At this time, the ink passage section 2 and the nozzle section 3 are also formed in coincidence.

[0015] Next, hydrophilic processing is performed to the ink passage section 2. Hydrophilic down stream processing is immersed in the passage substrate 1 whole into a chromic acid and sulfuric-acid liquid, and is performed by washing the whole passage substrate. A front face is activated with a chromic acid and a sulfuric acid, and a hydrophilic property is given to the front face of the whole passage substrate immersed in this chromic acid and sulfuric acid. Consequently, while the hydrophilic property of the ink passage section 2 of the passage substrate 1 improves, 1d plating processing also becomes easy a nozzle side side.

[0016] Next, water-repellent down stream processing of the nozzle section 3 of the passage substrate 1 is performed by performing non-electrolyzed compound plating to 1d the nozzle side side of a passage substrate.

[0017] Non-electrolyzed compound plating is performed by immersing only a nozzle side calmly into a nickel-P solution. As shown in drawing 1, the layer 4 of the matter which has the water repellence set only to outlet section 3b of 1d of nozzle sides of the passage substrate 1 and a nozzle from the deposit of nickel-P by this plating processing is formed. Since the diameter of outlet section 3b of the nozzle section 3 is as minute as dozens of micrometers at this time and plating does not reach the interior unless plating liquid is circulated compulsorily, plating is performed only to outlet section 3b of 1d and the nozzle section a nozzle side side.

[0018] If the plating liquid to which the eutectoid of the particle of a fluororesin is carried out is used as non-electrolyzed compound plating, since a water-repellent high fluororesin carries out an eutectoid and covers to the inner skin of outlet section 3b of the nozzle section 3, the water repellence of the nozzle section can be raised.

[0019] As other examples, as shown in drawing 3, the electroless deposition layer 14 is formed in the nozzle side of the passage substrate 11, and the matter 15, such as water-repellent high matter, for example, acrylic, or an amino-alkyd-resin system, is further covered with electropainting on it. If it carries out like this, the water repellence of the nozzle section 13 will improve and the regurgitation of ink will become good further.

[0020] When operating the electroless deposition layer 14 only as surface treatment of electropainting, if it is metal deposits, such as Cu, although it is good, the electroless deposition layer to which the eutectoid of the water-repellent high matter, such as a fluororesin, was carried out, then a water-repellent high thing will be obtained further anything.

[0021] In addition, in this example, although the good ABS plastics of plating nature are adopted as a material of a passage substrate, when other substrate ingredients, such as glass and a ceramic, constitute this, it can apply similarly.

[0022]

[Effect of the Invention] Since it is what manufactures an ink jet head through the stroke which performs hydrophilic processing to the ink passage section of a passage substrate, and performs water-repellent processing to the nozzle section according to this invention, the same material can constitute the part of which a high hydrophilic property is required, and the part of which the high water repellence which is the property which disagrees with this is required. For this reason, the configuration of an ink jet head becomes easy and it contributes to the reduction in the cost of an ink jet head.

[0023] Moreover, as water-repellent down stream processing, if it is made to carry out the eutectoid of the matter which has water repellence to the nozzle section with non-electrolyzed compound plating, the water repellence of the nozzle section will improve and the ink jet head on which the engine performance exceeded further will be obtained. If it is made to deposit the water-repellent high matter with an electrodeposition process further again after plating the nozzle section by the electroless deposition method, manufacture of the ink jet head which exceeded further further will be attained.

[Translation done.]

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TECHNICAL FIELD

[Industrial Application] This invention relates to the manufacture approach of an ink jet head.

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PRIOR ART

[Description of the Prior Art] The configuration of the common passage substrate of an ink jet head puts a cover plate on the field which has formed the passage slot, makes ink passage, and has prepared the nozzle section at the tip of ink passage. The pressurized room is prepared in the middle of ink passage, a piezoelectric device is prepared in the external surface of these pressurized rooms, the passage substrate which counters, or a cover plate, and grant of energy is enabled at the ink in a pressurized room.

[0003] The ink to which energy was given in the pressurized room is breathed out from the nozzle section through thin ink passage. Since the ink in ink passage runs by capillarity, as for ink passage, it is desirable for a hydrophilic property to be high. Therefore, hydrophilic processing has been performed, in order to adopt the high ingredient of a hydrophilic property as the member which constitutes ink passage or to make a hydrophilic property high. On the other hand, in order for the nozzle section to dissociate from the tip of a nozzle and to make ink jump out with sufficient vigor, it is desired for water repellence to be high. For this reason, carrying

out the laminating of the member from which a hydrophilic property constitutes a high passage substrate using a water-repellent high ingredient as a member which constitutes the nozzle section, and the member from which water repellence constitutes the high nozzle section is performed.

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EFFECT OF THE INVENTION

[Effect of the Invention] Since it is what manufactures an ink jet head through the stroke which performs hydrophilic processing to the ink passage section of a passage substrate, and performs water-repellent processing to the nozzle section according to this invention, the same material can constitute the part of which a high hydrophilic property is required, and the part of which the high water repellence which is the property which disagrees with this is required. For this reason, the configuration of an ink jet head becomes easy and it contributes to the reduction in the cost of an ink jet head.

[0023] Moreover, as water-repellent down stream processing, if it is made to carry out the eutectoid of the matter which has water repellence to the nozzle section with non-electrolyzed compound plating, the water repellence of the nozzle section will improve and the ink jet head on which the engine performance exceeded further will be obtained. If it is made to deposit the water-repellent high matter with an electrodeposition process further again after plating the nozzle section by the electroless deposition method, manufacture of the ink jet head which exceeded further will be attained.

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TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention] However, since the components mark of an ink jet head will increase and the number of assemblers will also increase if another member constitutes a passage substrate and the nozzle section as described above, it is the cause of cost quantity.

[0005] The purpose of this invention makes the nozzle section a passage substrate and one, ink passage has a high hydrophilic property, and it is in the nozzle section enabling cheaply manufacture of the ink jet head on which the engine performance exceeded by performing processing which makes water repellence high.

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MEANS

[Means for Solving the Problem] In order to attain the above-mentioned purpose, the manufacture approach of the ink jet head of this invention has the description in the place containing the process which forms the ink passage section and the nozzle section in a passage substrate, hydrophilic down stream processing which gives a hydrophilic property to the ink passage section by surface treatment, and water-repellent down stream processing which gives water repellence to the nozzle section by surface treatment.

[0007] After carrying out the eutectoid of the matter which has water repellence in the nozzle section with non-electrolyzed compound plating as water-repellent down stream processing or carrying out plating processing of the nozzle section by the electroless deposition method, it is desirable to deposit the matter which has water repellence in the nozzle section with an electrodeposition process.

[Translation done.]

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CLAIMS DETAILED DESCRIPTION TECHNICAL FIELD
PRIOR ART EFFECT OF THE INVENTION TECHNICAL
PROBLEM MEANS OPERATION EXAMPLE DESCRIPTION
OF DRAWINGS DRAWINGS

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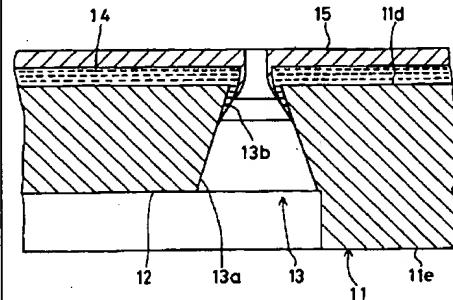
OPERATION

[Function] Jet of ink is made easy by performing hydrophilic processing to the ink passage section formed in the passage substrate, promoting circulation of ink and performing water-repellent processing to the nozzle section formed in the same passage substrate. Therefore, the ink passage section which has a hydrophilic property in the same passage substrate, and the nozzle section which has water repellence can be prepared, it is not necessary to also use as another member that with which a property disagrees, and an ink jet head configuration becomes easy.

[0009] If the eutectoid of the matter which has water repellence in the nozzle section with non-electrolyzed compound plating is carried out as water-repellent down stream processing, the water repellence of the nozzle section will improve further.

[0010] Moreover, as water-repellent down stream processing, after

Drawing selection [Representative drawing]



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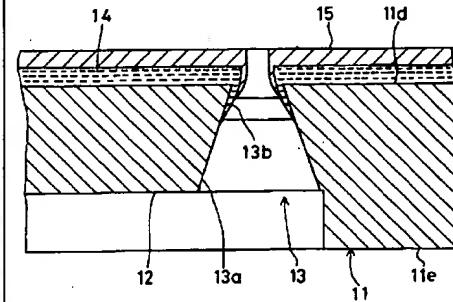
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EXAMPLE

[Example] The example of this invention is explained with reference to a drawing below. Since the ink jet head concerning this invention has the description in the place which performs hydrophilic processing to the ink passage formed in the passage substrate, and performs water-repellent processing to the nozzle section and the same configuration and same manufacturing method as the conventional technique are used for it about other general configurations, suppose it that only a passage substrate is explained here.

[0012] As shown in drawing 4, the passage substrate 1 is assembled on both sides of disk section 1a, it has the projected parts 1b and 1b of business, and the 24 ink passage sections 2 are provided in the plate surface at the radial. As a passage substrate 1, plating processing has adopted the injection-molded product of

Drawing selection [Representative drawing]



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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] It is the model Fig. showing the condition of having performed water-repellent processing to the nozzle section of a passage substrate by the electroless deposition method.

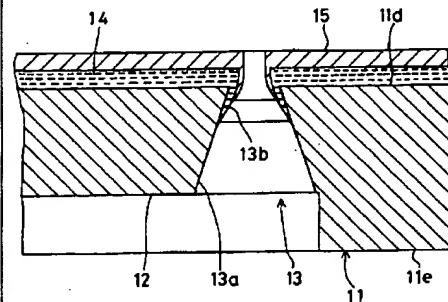
[Drawing 2] It is the model Fig. showing the condition of the passage substrate before water-repellent processing.

[Drawing 3] It is the model Fig. showing the condition of having performed electroless deposition processing to the nozzle section of a passage substrate, and having performed water-repellent processing with the electrodeposition process on it.

[Drawing 4] It is the top view showing the example of a configuration by the side of the passage section of a passage substrate.

[Description of Notations]

Drawing selection [Representative drawing 



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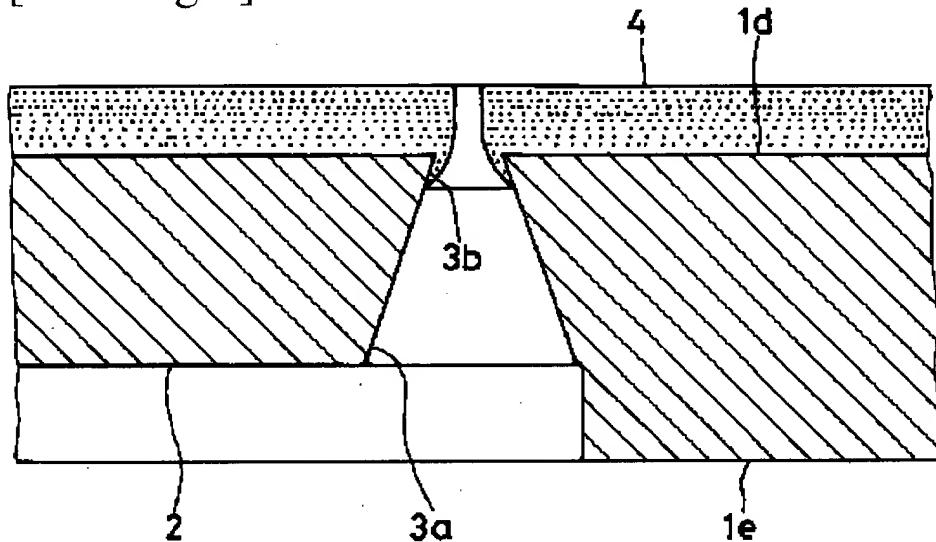
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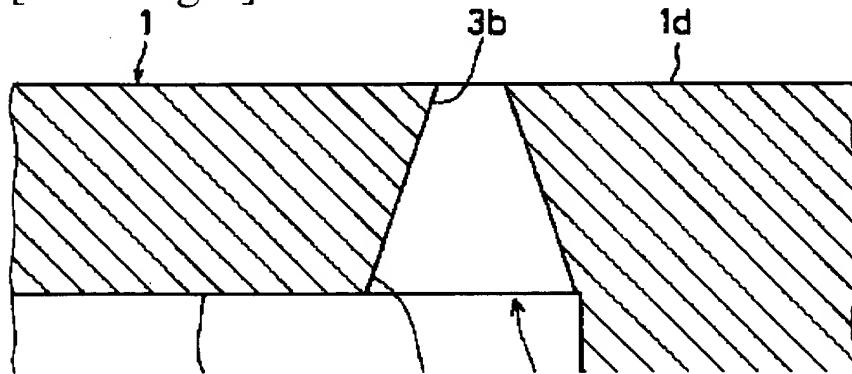
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DRAWINGS

[Drawing 1]

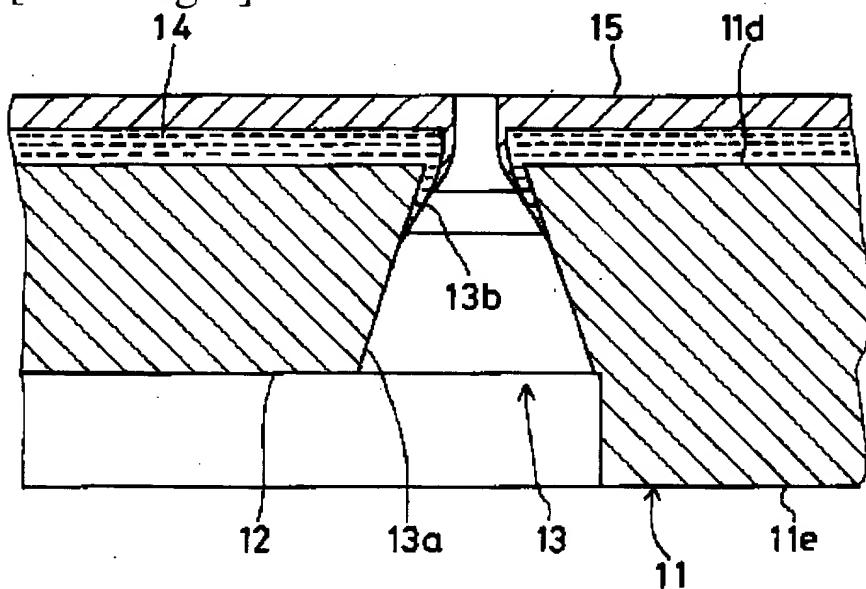


[Drawing 2]

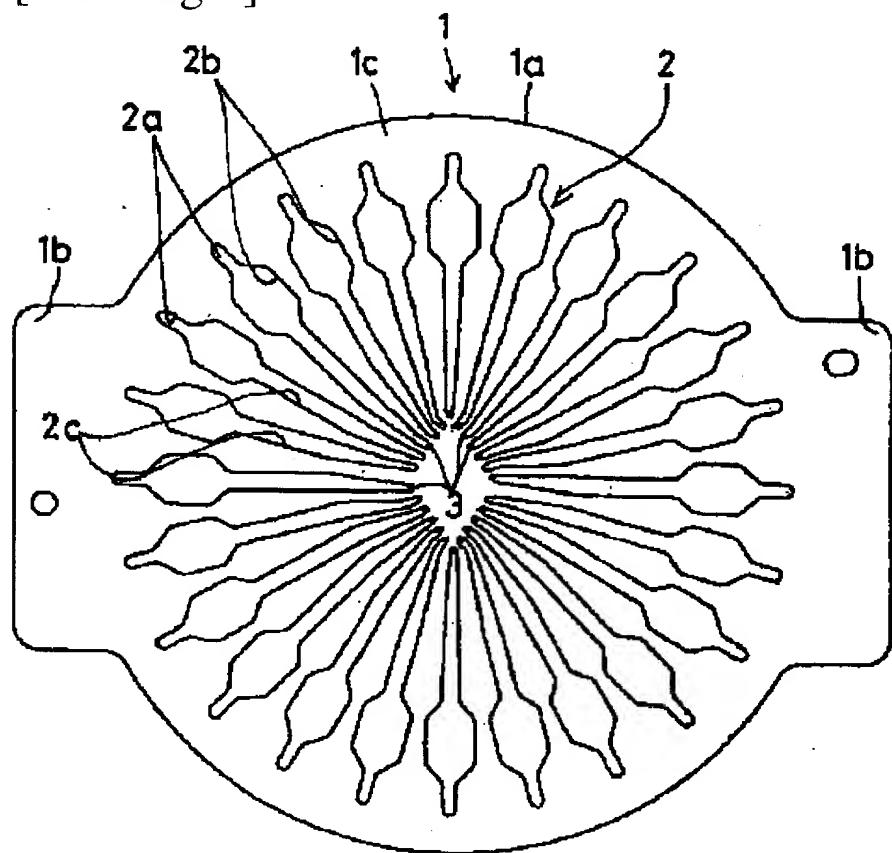


2 3a 3 1e

[Drawing 3]



[Drawing 4]



MANUFACTURE OF INK JET HEAD

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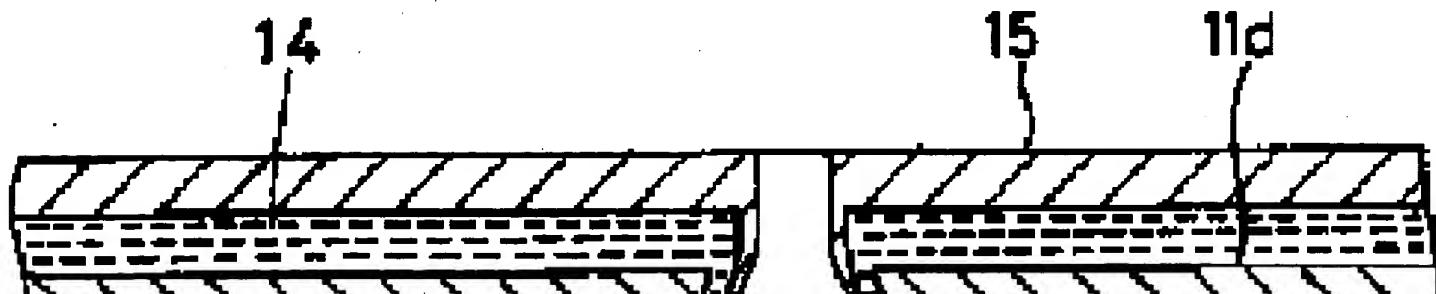
JAPIO Class: 29.4 (PRECISION INSTRUMENTS -- Business Machines)

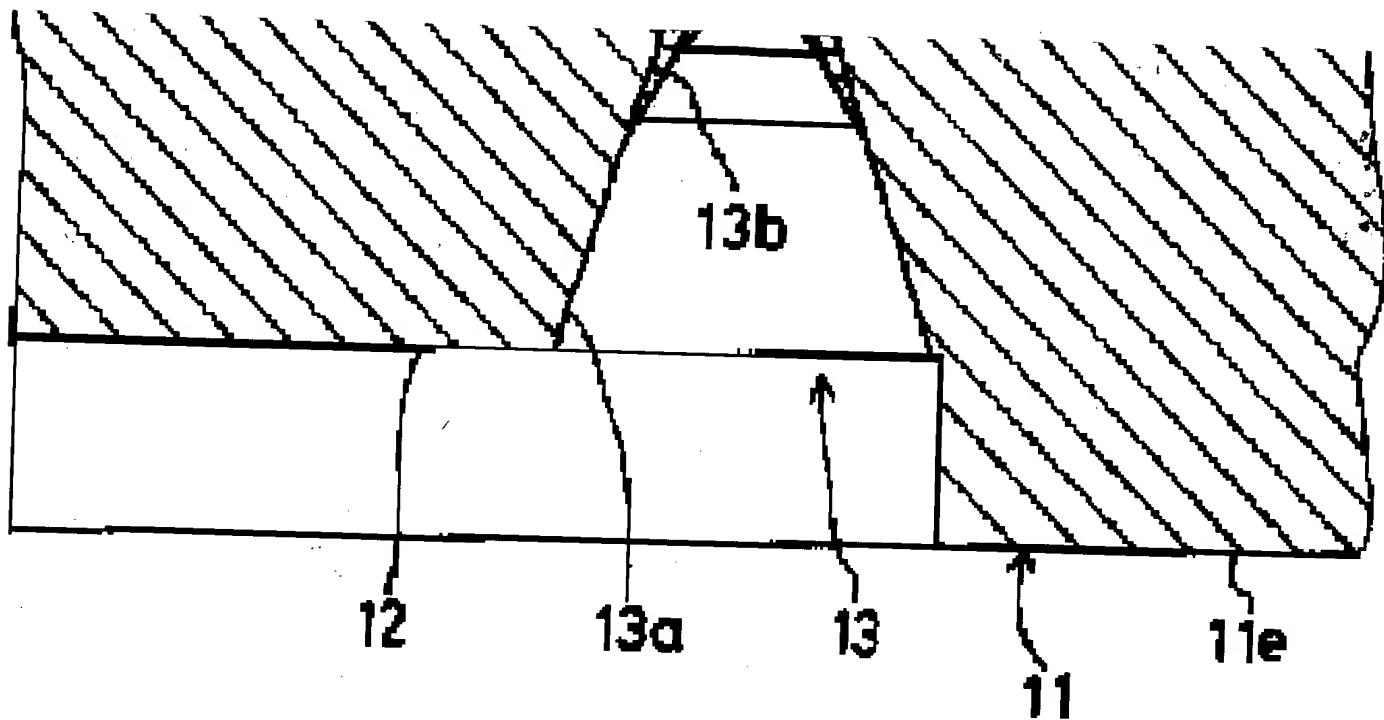
JAPIO Keyword: R105 (INFORMATION PROCESSING -- Ink Jet Printers)

ABSTRACT

PURPOSE: To manufacture inexpensively ink jet heads with high abilities by increasing a hydrophilic property in the ink channel of a passage base plate, and increasing water repellency in its nozzle part.

CONSTITUTION: Formed in use of ABS resin is a passage base plate 11 having an ink channel 12 and nozzle part 13. The process for a hydrophilic property is performed such that the entire of the passage base plate is immersed in a solution of chronic acid and sulphuric acid. In this manner, the whole of the passage base plate is given water repellency. Next, the nozzle surface side 11d of the passage base plate is soaked in a solution of Ni-P composite coatings so that a coating film having high water repellent eutectoid Ni-P is formed on the nozzle both sides and inner circumferential surface of outlet 13b of the nozzle part. In the case where further high water repellency is required, the layer of a substance 15 with high water repellency is formed on the Ni-P coated surface 14 by electro-deposition. As a result, the ink channel 12 of the passage base plate 11 has a hydrophilic property, and the outlet 13b of the nozzle part 13 has a high water repellency, and further by employing this method, ink discharge performance comes to be excellent.





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